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REMARKS

Claims 1-17 are pending in the application. Claims 1 and 11 have been amended to make explicit the intended connections between the first and second interlocked relays that comprise the pair of interlocked power relays. No narrowing amendment is intended. New dependent claims 12-17 have been added. Support for these new claims can be found, for example, in connection with the description of Figs. 1 and 5. No new matter has been added.

Figures 1 and 5 have been amended according to the attached replacement drawing sheets. The changes made thereto are indicated in marked-up drawing sheets, also attached herewith.

Objections to the Drawings

The drawings were objected to for failing to include every feature of the invention claimed. In particular, it was indicated that the single electrical housing is not included in the drawings. Applicant has noted the Examiner's comments with appreciation, and has accordingly amended Fig. 1 to add a representation of the electrical panel enclosure. Furthermore, Applicant has added circuit breakers to figure 1 to more clearly present the description presented in the specification. Likewise, Figure 5 has been amended to add reference numerals 103 and 104, as well as the backup power circuit breaker.

Applicant respectfully submits that the above changes to the drawings do not introduce any new matter. Rather, the nature of the changes is to clarify the disclosure of embodiments of the present invention.

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35 U.S.C. § 103(a)

Claims 1, 3-5, and 7-11 were rejected under 35 U.S.C. § 103(a) as being obvious over Schnackenberg et al. (U.S. Patent No. 6,172,432) in view of Motoki (U.S. Patent No. 5,124,881). These rejections are respectfully traversed.

The Schnackenberg et al. patent

In the Office Action, the Schnackenberg et al. patent was relied upon as teaching most of the limitations of independent claims 1, 8, and 11. In particular, the Office Action is based upon erroneous conclusions that the Schnackenberg et al. patent teaches (1) "circuit breakers connected to the primary source, the backup source, *and a load*;" and (2) "*a pair of electrically interlocked power relays electrically connected between the load circuit breaker and the primary circuit breaker and the backup circuit breaker.*" Applicant respectfully submits that the Schnackenberg et al. patent does not teach or suggest these limitations. Furthermore, Applicant respectfully submits that the Schnackenberg et al. patent does not teach or suggest (3) control logic including a state machine controller, or using a state machine to automatically control the operation of the power relays, as claimed in independent claims 1 and 11, respectively.

1. Three separate circuit breakers for main power, backup power, and load

The Schnackenberg et al. patent is directed to an automatic transfer switch (ATS) that features load circuit prioritizing for supplying the limited backup power to selected load circuits based on their assigned relative priorities. The disclosed ATS electrical configuration is illustrated in Figures 1a and 1b of the Schnackenberg et al. patent. Referring to Figure 1a, utility

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power circuit breakers 160 are in breaker box 130 of residence 100. Backup generator circuit breakers 210 are in the transfer switch 180. Circuit breakers 91-98, illustrated in Fig. 1b, are analogous to backup generator circuit breakers 210 (col. 6, lines 23-24) and are presented as part of the transfer switch. There is no teaching or suggestion of the three ATS power ports having separate circuit breakers, as is claimed in independent claims 1, 8, and 11.

Independent claims 1 and 11 respectively claim an ATS structure, and a method including providing an electrical panel for the ATS, comprising at least three circuit breakers housed in a single electrical panel: the first circuit breaker connected to the primary source; the second circuit breaker connected to the backup source; and at least a third circuit breaker connected to a load. The Schnackenberg et al. patent does not teach or suggest such a configuration of *three separate* circuit breakers at the power ports of the ATS. Although circuit breakers 160 (Fig. 1a) associated with the utility power source, and circuit breakers 210 (Fig. 1a) and 91-98 (Fig. 1b), located between the backup generator and load are disclosed in the Schnackenberg et al. patent, the configuration described in the Schnackenberg et al. patent does not permit a pair of electrically interlocked power relays to be electrically connected between the at least third circuit breaker and the first circuit breaker and the second circuit breaker, as claimed in independent claims 1 and 11. It follows that the Schnackenberg et al. patent does not teach or suggest the at least third circuit breaker (on the load side) electrically connected to the pair of electrically interlocked relays, while the pair of relays are also connected to the first and second circuit breakers, as required by claims 1 and 11.

Likewise, not all limitations of independent claim 8 are taught or suggested by the Schnackenberg et al. patent. For example, independent claim 8 claims wiring at least a third

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circuit breaker housed in the electrical panel for the ATS to at least one load in the residence. The Schnackenberg et al. patent does not teach or suggest this method step. Because no three separate circuit breakers are taught or suggested by Schnackenberg et al. patent, there can be no express or implied method that includes wiring a first circuit breaker to the main electrical panel, wiring a second circuit breaker to the backup source, and wiring the third circuit breaker to a load, as claimed in claim 8. Furthermore, referring to Fig. 1b of the Schnackenberg et al. patent, circuit breakers 91-98 cannot be "wired" to the load because there must be switches located between nodes A1-B4 and the corresponding loads for switching between utility (line) power and backup generator power.

Furthermore, Applicant respectfully submits that the Schnackenberg et al. patent teaches away from the configuration of three separate circuit breakers claimed in independent claims 1, 8, and 11. For instance, circuit breakers 91-98 of the Schnackenberg et al. patent perform the dual role of protecting the backup generator from over-current, while protecting each load circuit A1-B4 from over-current. Each of the eight circuit breakers 91-98 corresponds to one of the circuits A1-B4, but four circuit breakers (92, 94, 96, 98) are connected in parallel to generator line A, and four circuit breakers (91, 93, 95, 97) are connected in parallel to generator line B. Although this configuration protects both the load circuits and the backup generator from over-current occurring at the load, there is no dedicated single circuit breaker for protecting any of the backup generator lines from an over-current event occurring in the ATS between the generator terminal and the relay switches. Assuming that it is very unlikely that such an over-current condition would occur in such point in the ATS, the combined functionality of protecting the source and load by circuit breakers 91-98 effectively avoids having to use yet another circuit

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breaker for dedicated protection of the backup generator. It is therefore respectfully submitted that the combined circuit protection scheme of the Schnackenberg et al. patent teaches away from the use of a dedicated circuit breaker for each of the generator lines, as claimed in independent claims 1, 8, and 11, where there is no combined source and load protection, but there is dedicated over-current protection for each power source, as well as for the load.

2. *The pair of relays*

The Schnackenberg et al. patent describes the generator selector switch in column 2, beginning at line 27 as follows:

A plurality of switches are provided, corresponding and connected to respective ones of the plurality of electrical residential outputs [of the ATS]. Each switch is operably configured for switching between two contact positions, a first contact position connecting at least one electrical residential output to at least one electrical utility input, and a second contact position connecting the at least one electrical residential output to at least one electrical generator input, the switches being actuatable to move from one of the contact positions to the other of the contact positions, upon receipt of an actuation signal.

By contrast, currently amended independent claims 1 and 11 claim a pair of first and second electrically interlocked power relays, the first power relay electrically connected between the at least third circuit breaker and the first circuit breaker, and the second power relay electrically connected between the at least third circuit breaker and the second circuit breaker. The Schnackenberg et al. patent does not teach or suggest *a pair* of power relays as claimed in claims 1 and 11, wherein each of the pair of relays is connected at one end to the at least third circuit breaker (load side), and wherein each of the pair of relays is connected at another end to a *different* one of the first and second circuit breakers (utility power/backup generator side). Applicant respectfully points out that each of the plurality of switches described in the

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Schnackenberg et al. patent essentially *toggles* between the utility power line, and the backup generator line, whereas independent claims 1 and 11 claim a *pair* of relays, electrically interlocked, *each* electrically connected to make or break the connection between the at least third circuit breaker and the corresponding *one* of either the first or second circuit breaker.

3. State Machine

Independent claims 1 and 11 also respectively claim a state machine and using a state machine for controlling the operation of the power relays. Applicant respectfully points out that the Schnackenberg et al. patent does not teach or suggest a state machine for controlling operation of power relays. Although the Schnackenberg et al. patent discusses employing a microcontroller (e.g. col. 7, line 21) as part of the controller, a state machine as claimed in independent claims 1 and 11 is not taught or suggested. Applicant respectfully submits that the microcontroller as taught by the Schnackenberg et al. patent is not described as a state machine where decision points are based on changes in the states experienced by the system, and is not suggestive thereof. Although a state machine as claimed in claims 1 and 11 is not exclusive of a microcontroller (the designer may choose to implement a state machine *using* a suitably programmed microcontroller), the description in the Schnackenberg et al. patent of a microcontroller is not indicative or suggestive of a state machine in particular.

The Motoki Patent

The Motoki patent was relied upon in the Office Action for showing power transfer switchgear enclosed in a single housing. In general, the Motoki patent is directed to a particular

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beneficial mechanical arrangement of the switchgear components, including air circuit breakers (ACB). Although the Motoki patent describes switchgear housed in a single enclosure, as well as circuit breakers at every power port, including power sources and loads, it is respectfully submitted that not all limitations claimed in independent claims 1, 8, and 11 are taught or suggested by a combination of the Schnackenberg et al. and Motoki patents.

According to the Motoki patent, the ACBs are the switching components, rather than relays or separate switches as claimed in independent claims 1, 8, and 11, and as described in the Schnackenberg et al. patent. Therefore, the claimed arrangement of circuit breakers and the pair of electrically interlocked power relays claimed in independent claims 1 and 11 is not taught or suggested by the Motoki patent. Furthermore, no combination of the Schnackenberg et al. and Motoki patents can achieve the configuration claimed in independent claims 1 and 11. For example, there is no teaching or suggestion among either of the cited references of a pair of first and second electrically interlocked power relays, the first power relay electrically connected between the at least third circuit breaker and the first circuit breaker, and the second power relay electrically connected between the at least third circuit breaker and the second circuit breaker, as claimed in amended claims 1 and 11. The Motoki patent does not teach or suggest anything related to the claimed configuration of relay switches and circuit breakers. Indeed, Applicant respectfully points out, the Motoki patent teaches away from such a configuration by describing a switchgear scheme where the circuit breakers, themselves, are the controlled switching elements.

Applicant further submits that there is no motivation to combine the Schnackenberg et al. and Motoki patents to achieve the invention claimed in independent claims 1, 8, and 11. As

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regarding the Motoki patent, because the switchgear includes controlled switches, there is simply no reason to add any ATS including low-power relay switches. Moreover, the Motoki patent is directed to a particular physical configuration of switchgear components to achieve benefits such as symmetry, size reduction and interchangeability of the high-power switchgear components. Nothing in the Schnackenberg et al. patent furthers these objectives.

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CONCLUSION

In view of the above, independent claims 1, 8, and 11 are believed to be patentable over any combination of the cited references. Furthermore, as dependent claims 2-7 and new dependent claims 12-14 further define patentably distinct independent claim 1, as dependent claims 9 and 10 further define patentably distinct independent claim 8, and as new dependent claims 15-17 further define independent claim 11, these dependent claims are also believed to be allowable. In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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